

Editorial: Peer (Expert) Review in LCA

Peer (Expert) Review in LCA According to SETAC and ISO 14040 Theory and Practice

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1 Why a Peer (Expert) Review?

The Main Reason for performing a peer or expert review consists in the fact that a full publication of all relevant data is not possible in most LCA studies for reasons of confidentiality. The peer review should therefore guarantee that the study has been well performed according to established rules and standards, that the data are sufficient and the conclusions are in accordance with the goal definition, the method used and the data quality.

In order to perform this duty, the reviewer has to be qualified and independent of both the commissioner and the practitioner (assuming the frequent situation that the LCA is performed by an external consultant, the practitioner).

2 Peer Review According to SETAC

The first codification of the peer review process is part of the SETAC "Code of Practice" (SETAC, 1993). The following benefits have been stated:

1. The peer review process enhances the scientific and technical quality of LCAs.
2. The process helps to focus study goals, data collection, and provides a critical screening of study conclusions, thereby enhancing study credibility.

The peer review is seen as a process rather than as an isolated activity after the study. Ideally, according to SETAC, the peer review panel should accompany the study rather than finalizing it.

The peer review according to SETAC is much more extensive than the traditional peer review practised by scientific and technical journals of high quality. As a rule, it is performed by a panel rather than by an individual, a feature which should reflect the target groups of the LCA.

The chairperson of the panel is appointed by the commissioner (sponsor) of the study, the other members are invited by the chairperson in accordance with the sponsor.

In contrast to ISO 14040, SETAC provides a set of useful rules concerned with the performance of the peer review.

3 Critical Review According to ISO 14040

According to ISO (ISO 1997), some kind of critical review should be performed in each LCA; the depth of the review, however, depends on the intended use of the study. An internal study performed in a company may be reviewed by an expert of the same firm ("Internal expert review") consequently leading to a kind of self declaration which may be sufficient for this purpose.

Studies used for public assertions (e.g. of the type "product A is better than B") have to be reviewed most strictly by external, independent experts ("External expert review"). This latter review seems to be near to the "Peer review" conceived by SETAC although not much information is provided on how to perform this expert review. Single experts and panels ("Review by interested parties") are proposed by the ISO depending on the purpose and scope of the study. The expert review report is part of the final report of the study.

4 Main Tasks of the Reviewers

The actual tasks depend on the type of LCA and should be defined before starting the review (proposal by the chairperson to the sponsor; review-contract); rules for handling disagreement within the panel should be established before the start (a consensus about this procedure within the panel is essential). The full independence of the panel has to be guaranteed by the sponsor. Common to most reviews are the following tasks:

- ♦ To check the
 - ♦ completeness
 - ♦ internal consistency and
 - ♦ transparency of the report(s),
- ♦ to find out whether
 - ♦ the quality of the data is sufficient (depending on goal and scope)
 - ♦ existing guidelines (e.g. SETAC) and standards (e.g. ISO standards and draft standards, national standards) have been taken into account
 - ♦ data and system boundaries are consistent
 - ♦ allocations and cut-off criteria have been stated
 - ♦ the impact assessment (if there is any) is appropriate for the system(s) studied.

It is not the duty of the reviewers to check and recalculate all data. Selected data should be checked in detail, starting from the original data supplied by industry and from the generic data sets used. In addition, each panellist compares data with those known to him or her from previous work; this results in a plausibility check of many data for which no detailed scrutiny can be performed due to limits of time. Finally, the review panel has to formulate its findings in a report (chairperson in agreement with the co-panellists; consensus should be reached within the panel). This report should contain suggestions for improvements of the study, which may be included before the final report and the final version of the peer review report is written. It may also contain suggestions for further work to be done in order to improve or update the study in due time.

5 Experiences from Practice

The peer or expert reviews conducted thus far allow the following conclusions (see also KLÖPPER et al. 1995, 1996; FAVA et al. 1997):

1. ISO 14040 is a strong incentive for performing an expert review.
2. Large panels representing the majority of stakeholders are too expensive in general.
3. The average size of panels is three (chairperson + 2 co-panellists).
4. The SETAC-Guidelines ("Code of Practice" 1993) provide useful rules of how to perform a review.
5. The review is often performed a posteriori, not accompanying the study as suggested by SETAC.
6. If performed a posteriori, the best time to start is when the Draft Final Report is available; at that time it is still possible to include improvements suggested by the reviewers.
7. Even well performed studies can be improved considerably.
8. The review is time-consuming, even if performed a posteriori (a few months to about one year, including the time needed to perform the improvements).
9. The original data has to be fully accessible to the panel or at least to one member of the panel (confidentiality agreements). The commissioner has to make sure that the practitioner co-operates with the panel. The openness and willingness to co-operate also has to be secured in case of sub-contracts or external data providers used by the practitioner.

10. Some LCA-studies are accompanied by a stakeholder (interested parties) panel providing data and advice; in this case, the review panel has much less or no demand for stakeholder representation. A small expert panel is sufficient in this case and the review may well be performed a posteriori. Alternatively, a reviewer may be part of the accompanying multi-stakeholder panel from the beginning.

11. Conducting a peer or expert review is a highly interactive job within the panel and in the triangle sponsor-practitioner-review panel. To assure this interplay is mainly the duty of the chairperson together with the project leaders of commissioner and practitioner (or other responsible contact persons).

12. Mutual trust and confidence are essential in conducting a review (competitive structures in practitioner/panel relationships, etc. should be avoided); an open and friendly working climate is helpful.

6 Concluding Remarks

Peer review has become a necessity for LCAs presented to the public. If conducted properly, peer review may improve the quality of LCAs considerably. There is no recent and detailed guidance, however, which provides advice concerned with how to perform the review according to ISO 14040. Meanwhile, the SETAC Guidelines, "A Code of Practice" (1993), can be used for guidance.

7 References

- FAVA, J.; POMPER, S. (1997): Life-Cycle Critical Review! Does it Work? *Int. J. LCA* 2/3, 145-153
- International Organization for Standardization (ISO), Technical Committee TC 207/Subcommittee SC 5 (1997): Environmental Management – Life Cycle Assessment – Principles and Framework. International Standard 14040, June 1997
- KLÖPPER, W.; GRIßHAMMER, R.; SUNDSTRÖM, G. (1995): Overview of the Scientific Peer Review of the European Life Cycle Inventory for Surfactant Production. *Tenside Surf. Det.* 32, 378-383
- KLÖPPER, W.; SUNDSTRÖM, G.; GRIßHAMMER, R. (1996): The Peer Reviewing Process – A Case Study: European Life Cycle Inventory for Surfactant Production. *Int. J. LCA* 1/2, 113-115
- Society of Environmental Toxicology and Chemistry (SETAC) (1993): Guidelines for Life Cycle Assessment: A "Code of Practice". Edition 1. From the SETAC Workshop held at Sesimbra, Portugal, 31 March – 3 April 1993. Brussels, Belgium, and Pensacola, Florida, USA, August 1993